WHAT IS CLAIMED IS:

1. A semiconductor laser device comprising:

a first mount;

a second mount formed by a heat sink having a heat conductivity of 500 W/(m*K) or more and joined to the first mount through a first multi-layer film including a gold thin film; and

a semiconductor laser element joined to the second mount through a second multi-layer film including a gold thin film, said semiconductor element having a diffraction grating, an emission edge, a reflection edge and an active layer,

wherein said semiconductor laser element is configured to output a laser beam having a plurality of oscillation longitudinal modes through the emission edge, and

the plurality of oscillation longitudinal modes are output in accordance with a wavelength selection characteristic of the diffraction grating formed between the emission edge and the reflection edge and nearby the active layer.

2. The semiconductor laser device according to claim 1, further comprising:

a third mount joined to the first mount through a third multi-layer film including a gold thin film; and

a temperature measuring element joined to the third mount through a fourth multi-layer film including a gold thin film and configured to measure a temperature of the semiconductor laser element.

3. The semiconductor laser device according to claim 2, wherein:

the second mount comprises diamond.

4. The semiconductor laser device according to claim 3, wherein:

the second mount is configured to minimize heat resistance relative to a semiconductor laser element length, width and thickness.

5. The semiconductor laser device according to claim 4, wherein:

the second mount has a thickness of at least 0.4 mm, a length of at least 3.2 mm and a width of at least 3.2 mm when the semiconductor laser element is configured to have a thickness of not more than 0.13 mm, a length of not more than 3.2 mm and a width not more than of 0.35 mm

6. The semiconductor laser device according to claim 4, wherein:

the second mount has a thickness of at least 0.3 mm, a length of at least 2.7 mm and a width of at least 1.0 mm when the semiconductor laser element is configured to have a thickness not more than of 0.13 mm, a length of not more than 2.7 mm and a width of not more than 0.35 mm

7. The semiconductor laser device according to claim 3, wherein:

the second mount comprises a polycrystal diamond.

8. The semiconductor laser device according to claim 1, further comprising:

a temperature measuring element joined to the first mount through a third multi-layer film including a gold thin film and configured to measure a temperature of the semiconductor laser element.

9. The semiconductor laser device according to claim 8, wherein:

the second mount comprises diamond.

10. The semiconductor laser device according to claim 9, wherein:

the second mount is configured to minimize heat resistance relative to a semiconductor laser element length, width and thickness.

11. The semiconductor laser device according to claim 10, wherein:

the second mount has a thickness of at least 0.4 mm, a length of at least 3.2 mm and a width at least of 3.2 mm when the semiconductor laser element is

configured to have a thickness not more than of 0.13 mm, a length of 3.2 mm and a width not more than of 0.35 mm

12. The semiconductor laser device according to claim 10, wherein:

the second mount has a thickness of at least 0.3 mm, a length of at least 2.7 mm and a width of at least 1.0 mm when the semiconductor laser element is configured to have a thickness of not more than 0.13 mm, a length of 2.7 mm and a width of not more than 0.35 mm

13. The semiconductor laser device according to claim 9, wherein:

the second mount comprises a polycrystal diamond.

14. The semiconductor laser device according to claim 9, wherein:

the second mount is covered with a metallic foil including a gold thin film.

15. The semiconductor laser device according to claim 1, further comprising:

a temperature measuring element joined to the second mount through a third multi-layer film including a gold thin film and configured to measure a temperature of the semiconductor laser element.

16. A semiconductor laser module comprising:

a semiconductor laser device having

a first mount,

a second mount formed by a heat sink having a heat conductivity of 500 W/(m*K) or more and joined to the first mount through a first multi-layer film including a gold thin film, and

a semiconductor laser element configured to emit a laser beam having a plurality of oscillation longitudinal modes, joined to the second mount through a second multi-layer film including a gold thin film, and having a diffraction grating, an emission edge, a reflection edge and an active layer, wherein

the plurality of oscillation longitudinal modes are output in accordance with a wavelength selection characteristic of the diffraction grating formed between the emission edge and the reflection edge of the laser element and nearby the active layer of the laser element;

an optical fiber configured to guide the laser beam outside the module; and

an optical coupling lens system that couples the semiconductor laser device to the optical fiber.

17. The semiconductor laser module according to claim 16, further comprising

an isolator set in the optical coupling lens system and configured to suppress a return light reflected from an optical fiber side of the optical coupling lens system.

18. The semiconductor laser module according to claim 16, wherein:

the semiconductor laser device comprises a third mount joined to the first mount through a third multi-layer film including a gold thin film; and

a temperature measuring element joined to the third mount through a fourth multi-layer film including a gold thin film and configured to measure a temperature of the semiconductor laser element.

19. The semiconductor laser module according to claim 18, wherein:

the second mount comprises diamond.

20. The semiconductor laser module according to claim 19, wherein:

the second mount is configured to minimize heat resistance relative to a semiconductor laser element length, width and thickness.

21. The semiconductor laser module according to claim 20, wherein:

the second mount has a thickness of at least 0.4 mm, a length of at least 3.2 mm and a width of at least 3.2 mm when the semiconductor laser element is configured to have a thickness of 0.13 mm, a length of 1.5 mm and a width of 0.35 mm

22. The semiconductor laser module according to claim 20, wherein:

the second mount has a thickness of at least 0.3 mm, a length of at least 2.7 mm and a width of 1.0 mm when the semiconductor laser element is configured to have a thickness of not more than 0.13 mm, a length of 1.5 mm and a width of not more than 0.35 mm

23. The semiconductor laser module according to claim 19, wherein:

the second mount comprises a polycrystal diamond.

24. The semiconductor laser module according to claim 16, wherein:

the semiconductor laser device comprises a temperature measuring element joined onto the first mount through a third multi-layer film including a gold thin film and configured to measure a driving temperature of the semiconductor laser element.

25. The semiconductor laser module according to claim 24, wherein:

the second mount comprises diamond.

26. The semiconductor laser module according to claim 25, wherein:

the second mount is configured to minimize heat resistance relative to a semiconductor laser element length, width and thickness.

27. The semiconductor laser module according to claim 26, wherein:

the second mount is configured to have a thickness of at least 0.4 mm, a length of at least 3.2 mm and a width of at least 3.2 mm when the semiconductor laser element is configured to have a thickness of not more than 0.13 mm, a length of 3.2 mm and a width of not more than 0.35 mm

28. The semiconductor laser module according to claim 26, wherein:

the second mount is configured to have a thickness of at least 0.3 mm, a length of at least 2.7 mm and a width of at least 1.0 mm when the semiconductor laser element is configured to have a thickness of not more than 0.13 mm, a length of 2.7

mm and a width not more than of 0.35 mm

29. The semiconductor laser module according to claim 25, wherein:
the second mount comprises a polycrystal diamond.

30. The semiconductor laser module according to claim 25, wherein:
the second mount is covered with a metallic foil including a gold thin film.

31. The semiconductor laser module according to claim 16, wherein:
the semiconductor laser device further comprises a temperature measuring element joined onto the second mount through a third multi-layer film including a gold thin film and configured to measure a driving temperature of the semiconductor laser element.

32. A semiconductor laser device comprising:
a first mount;
a second mount formed by a heat sink having a heat conductivity of 500 W/(m*K) or more and joined onto the first mount through a first multi-layer film including a gold thin film;
a semiconductor laser element joined onto the second mount through a second multi-layer film including a gold thin film;
means for outputting a laser beam having a plurality of oscillation longitudinal modes in accordance with a wavelength selection characteristic of a diffraction grating formed between an emission edge and a reflection edge of the laser element and nearby an active layer of the laser element; and
means for suppressing a deterioration of optical output and service life of the semiconducting laser element, including
means for measuring a temperature of the semiconductor laser element, and
means for controlling the temperature of the semiconductor laser element.

33. A semiconductor laser module comprising:
a semiconductor laser device configured to emit a laser beam and having

a first mount,

a second mount formed by a heat sink having a heat conductivity of 500 W/(m*K) or more and joined onto the first mount through a first multi-layer film including a gold thin film, and

a semiconductor laser element joined onto the second mount through a second multi-layer film including a gold thin film;

an optical fiber for guiding the laser beam outside the module;

an optical coupling lens system for optically coupling the semiconductor laser device with the optical fiber;

means for outputting a laser beam having a plurality of oscillation longitudinal modes in accordance with a wavelength selection characteristic of a diffraction grating formed between an emission edge and a reflection edge of the laser element and nearby an active layer of the laser element;

means for measuring a temperature of the semiconductor laser element; and

means for controlling the temperature of the semiconductor laser element.